

WHAT IS CLAIMED IS:

1. A reagent system for substantially lysing red blood cells in a whole blood sample prior to leukocyte analysis, the reagent system comprising

a first reagent for substantially lysing the red blood cells in the whole blood sample, wherein the first reagent includes: a saponin compound; an acid selected from the group consisting of halogenated carboxylic acids, phosphoric acid or combinations thereof; and

a second reagent for quenching the activity of the first reagent, wherein the second reagent includes a base and has a pH value of about 8 to 12.

2. The reagent system of claim 1, wherein the first reagent further includes a surfactant.

3. The reagent system of claim 2, wherein the surfactant is selected from the group consisting of non-ionic surfactants, cationic surfactants and combinations thereof.

4. The reagent system of claim 3, wherein the surfactant is selected from the group consisting of ethoxylated decylalcohols, ethoxylated and propoxylated linear (C8 – C10) aliphatic alcohols, and combinations thereof.

5. The reagent system of claim 1, wherein the saponin compound is selected from the group consisting of saponin; heat treated saponin, saponin modified by heating in the presence of a halogenated carboxylic acid and combinations thereof.

6. A reagent system comprising:

a reagent for lysing red blood cells; and

a quench;

wherein the system is substantially free of compounds selected from the group consisting of:

i. dye;

- ii. a combination of saponin and carboxylic acid;
- iii. an acid selected from formic acid, acetic acid and mixtures thereof;
- iv. a combination of saponin and sulphonic acid;
- v. a cross-linking agent such as an aldehyde;
- vi. an alkali metal salt of an alkyl sulfate anionic surfactant;
- vii. an ethoxylated long chain amine; and combinations thereof.

7. The reagent system of claim 6, wherein the reagent for lysing red blood cells includes a saponin compound and an acid.

8. The reagent system of claim 7, wherein the saponin compound is selected from the group consisting of saponin; heat treated saponin, saponin modified by heating in the presence of a halogenated carboxylic acid and combinations thereof.

9. The reagent system of claim 8, wherein the acid is selected from the group consisting of halogenated carboxylic acids, phosphoric acid or combinations thereof.

10. The reagent system of claim 9, wherein the reagent for lysing red blood cells further includes a surfactant.

11. The reagent system of claim 10, wherein the surfactant is selected from the group consisting of non-ionic surfactants, cationic surfactants and combinations thereof.

12. The reagent system of claim 11, wherein the surfactant is selected from the group consisting of ethoxylated decylalcohols, ethoxylated and propoxylated linear (C8 – C10) aliphatic alcohols, and combinations thereof.

13. A method of lysing the red blood cells and stabilizing white blood cells present in a sample of whole blood, the method comprising:

combining a predetermined portion of the sample of whole blood with a predetermined portion of a first reagent for substantially lysing the red blood cells in the whole blood sample, wherein the first reagent includes: a saponin compound; and an acid; and

quenching the lysing action of said first reagent by the addition of a predetermined portion of a second reagent, wherein the second reagent includes a base and has a pH value of about 8 to about 12 to give a solution containing substantially lysed red blood cells, leukocytes and a pH value of about 3 to about 6.

14. The method of claim 13, wherein the saponin compound is selected from the group consisting of saponin; heat treated saponin, saponin modified by heating in the presence of a halogenated carboxylic acid and combinations thereof.

15. The method of claim 14, wherein the acid is selected from the group consisting of halogenated carboxylic acids, phosphoric acid or combinations thereof.

16. The method of claim 15, wherein the reagent for lysing red blood cells further includes a surfactant.

17. The method of claim 16, wherein the surfactant is selected from the group consisting of non-ionic surfactants, cationic surfactants and combinations thereof.

18. The method of claim 17, wherein the surfactant is selected from the group consisting of ethoxylated decylalcohols, ethoxylated and propoxylated linear (C8 – C10) aliphatic alcohols, and combinations thereof.